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Project Information

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EVALUATION OF POTASH FERTILIZER ON WHEAT YIELD AND DISEASE SUPPRESSION

PROJECT NUMBERS: D-88-05-0402
D-89-05-0529

FINAL REPORT

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ABSTRACT:

An Agriculture Development Fund project designed to evaluate the effect of potash fertilizer on spring cereal yield was completed in 1989.

Although soil test recommendations suggested that potassium soil levels were adequate for crop projection, additions of potash fertilizer gave measurable yield increases.

Although based on only one year's results and realizing that natural variability in yield exists, the results suggest that potash additions are worthy of further investigations.

OBJECTIVE:

To evaluate the effect of potash fertilizer on the yield of wheat and disease suppression.

PROCEDURE:

In the 1989 growing season, two cooperators included potash fertilizer in addition to regular fertilizer additions to wheat. This was compared to fields that had no potash fertilizer applied.



RESULTS:

(a) D-89-05-0529 (Hammerlindl - SW 26-24-27-W3)

In 1989 Lancer Red Spring Wheat was seeded on chemfallow. Soil tests taken in the spring showed no shortage of potassium. The control plot received 2 lbs. nitrogen/acre and 25 lbs. phosphorus/acre applied with the seed. The test plot received 6 lbs. nitrogen/acre, 15 lbs. phosphorus/acre and 10 lbs. potassium/acre applied with the seed. Soil tests recommended additions of 0 lbs. nitrogen/acre and 35 lbs. phosphorus/acre for wheat production.

Spring moisture probing showed about 16" moist soil. Both plots were discer seeded into chemfallow and harrowed after seeding. Seed was treated with Vitavax single purpose (fungicide) and seeded May 6th. The 1989 growing season was relatively dry. Drought and heat put severe stress on the crop. June and July rainfall totalled only .83 inches. The crop was harvested August 12.

Although there was no accurate count done with regard to root rot, a visual examination, with a plant pathologist present, seemed to show no reduction in infestation on the test plot.

Plant tissue analysis showed only the following differences between the control and test plots:

- the plants had a lot more iron where the potash had been applied (testplot).
- the plants that received potash had more phosphorus in them even though they received less phosphorus fertilizer than the control plot.

The yield checks showed a 3 bu/ac advantage in favour of the test plot (24.2 bu/ac vs. 21.2 bu/ac). This seems to be fairly accurate since exactly the same results were obtained from the square metre test as was obtained from the 2 acre strips that were combined and weighed separately. The soil test called for 30 lbs. of P to be added to both plots and called for no additional K. 25 lbs. of P was applied to the control plot while 15 lbs. of P blended with 10 lbs. of K was applied to the test plot. The yield advantage in favour of the test plot therefore raises the unexplainable possibility that the K or the P/K blend is of more value to the crop than is the P alone, at least under the adverse growing conditions which prevailed.

(b) D-88-05-0402 (Martin - NW 7-26-25-W3)

27 lbs. of potassium/acre was applied to part of a field seeded to Kyle durum in 1989. No other fertilizer was added, according to soil test recommendations. The crop was seeded on May 8th with discers and followed with harrowpackers. The potash was applied with the seed.

Drought and heat in July adversely affected the crop. The crop was harvested August 23. The test plot yielded 31.4 bu./ac while the control plot yielded 28.6 bu./ac.

Laboratory analysis found no vomitoxin or Deoxynivalenol (DON), Discetoxyscirpenol (DAS) mytoxins, and visual analysis, the only one available, found no Blackpoint or Penetrated Smudge in either the test or control samples. Visual inspection found approximately the same amount of Root Rot in both plots. No visual difference was discernible in the 19 July 1989 infrared photograph of the plots. No tissue samples were taken. The yield increase for the test plot was probably due to variability in terrain and soil type.

CONCLUSION:

Evaluation of response to potash fertilizer cannot be based on only one year's results. Research results have varied as well, with response in some years and none in others.

However, the results of these projects warrant further investigation. Trials on uniform land and tissue samples should be part of future projects. It may also be of value to compare a phosphorus/potassium blend to phosphorus alone and potassium alone.

The cost of applying potash fertilizer at 10 - 15 lbs. potassium/acre is approximately \$1.50 - \$2.25/acre. A small yield increase easily pays for the additional cost.